CLAIMS

1. A decoupling circuit for decoupling conduction lines from each other, the circuit comprising at least one pass gate element having conduction terminals connected to said conduction lines, and having at least one control terminal; and at least one protection circuit inserted between said control terminal and at least one of said conduction lines, said protection circuit comprising at least one protection transistor connected to said control terminal and said at least one of said conduction lines and configured to take in a disturbing signal passing through said pass gate element to properly decouple said conduction lines from each other.

2. The decoupling circuit of claim 1, wherein said protection circuit comprises at least one protection transistor inserted between a supply voltage reference and an internal conduction line and having a control terminal connected to the control terminal of said pass gate element.

3. The decoupling circuit of claim 2, wherein said protection circuit comprises another protection transistor having its conduction terminals connected to said at least one conduction line and to said internal conduction line and having a control terminal connected to the control terminal of said pass gate element.

4. The decoupling circuit of claim 3, wherein said protection transistor is a PMOS transistor in a pull-up configuration and said another protection transistor is an NMOS transistor in a pass-gate configuration.

5. The decoupling circuit of claim 1, wherein said protection circuit comprises at least one protection transistor having conduction terminals connected to the control terminal of said pass gate element and connected to said at least one conduction line and having a control terminal connected to a ground reference.

6. The decoupling circuit of claim 5, wherein said protection transistor is an NMOS transistor having a lower threshold voltage than a threshold voltage of said pass gate element.

7. The decoupling circuit of claim 1, wherein said protection circuit comprises at least a first portion connected between the control terminal of said pass gate element and at least one conduction line and at least a second portion inserted between the control terminal of said pass gate element and at least a further conduction line.

8. The decoupling circuit of claim 7, wherein said first portion comprises a first protection transistor inserted between a supply voltage reference and at least one internal conduction line and having its control terminal connected to the control terminal of said pass gate element, and said second portion comprises a second protection transistor having conduction terminals connected to the control terminal of said pass gate element and connected to said further conduction line and having a control terminal connected to a ground reference.

9. The decoupling circuit of claim 8, wherein said first portion further comprises an additional protection transistor having its conduction terminals connected to said at least one conduction line and said internal conduction line and having a control terminal connected to the control terminal of said pass gate element.

10. The decoupling circuit of claim 9, wherein the threshold voltage value of said additional protection transistor of said first portion is equal to a threshold voltage value of said pass gate element.

11. A decoupling circuit comprising:

a conduction transistor having first and second conduction terminals coupled to first and second conduction lines, respectively, and a control terminal coupled to an output of an inverter; and

a protection circuit coupled between the second conduction line and the second conduction terminal and further coupled to the output of the inverter, the protection circuit comprising a pull-up transistor having a first terminal coupled to a voltage source, a second terminal coupled to the second conduction terminal of the decoupling transistor, and a control terminal coupled to the output of the inverter, the pull-up transistor configured to prevent a disturbing signal from passing directly from the first conduction line to the second conduction line.

12. The circuit of claim 11, wherein the protection circuit further comprises a pass-gate transistor having a first terminal coupled to the second terminal of the pull-up transistor and to the second conduction terminal of the decoupling transistor, and a second terminal coupled to the second conduction line, and a control terminal coupled to the output of the inverter.

13. The circuit of claim 12, wherein the pull-up transistor is a PMOS transistor and the pass-gate transistor comprises an NMOS transistor, and further wherein the decoupling transistor comprises an NMOS transistor.

14. A decoupling circuit, comprising:

a decoupling transistor having first and second conduction terminals coupled to first and second conduction lines, respectively, and a control terminal coupled to an output of an inverter; and

a protection circuit having a first terminal coupled to the first conduction line and a second terminal coupled to the output of the inverter, the protection circuit configured to be in an "off" condition when the voltage on the first conduction line is higher than a ground reference potential to permit the decoupling transistor to be driven directly from the inverter, and the protection circuit further configured to have the voltage at the control terminal of the decoupling transistor follow the voltage on the first conduction line when the voltage on the first conduction line falls below the ground reference potential.

15. The circuit of claim 14, wherein the protection circuit comprises a protection transistor having a first terminal coupled to the first conduction line, a second terminal coupled to the output of the inverter, and a control terminal coupled to the ground reference potential.

16. The circuit of claim 15, wherein the protection transistor has a threshold voltage that is lower than a threshold voltage of the decoupling transistor.

17. A decoupling circuit, comprising:

a decoupling transistor having first and second conduction terminals coupled to first and second conduction lines, respectively, and a control terminal coupled to an output of an inverter;

a first protection circuit comprising:

a protection circuit coupled between the second conduction line and the second conduction terminal of the decoupling transistor and further coupled to the output of the inverter, the protection circuit comprising a pull-up transistor having a first terminal coupled to a voltage source, a second terminal coupled to the second conduction terminal of the decoupling transistor, and a control terminal coupled to the output of the inverter, the pull-up transistor configured to prevent a disturbing signal from passing directly from the first conduction line to the second conduction line;

a second protection circuit having a first terminal coupled to the first conduction line and a second terminal coupled to the output of the inverter, the protection circuit configured to be in an "off" condition when the voltage on the first conduction line is higher than a ground reference potential to permit the decoupling transistor to be driven directly from the inverter, and the protection circuit further configured to have the voltage at the control terminal of the decoupling transistor follow the voltage on the first conduction line when the voltage on the first conduction line falls below the ground reference potential.

18. The circuit of claim 17, wherein the first protection circuit further comprises:

a pass-gate transistor having a first terminal coupled to the second terminal of the pull-up transistor and to the second conduction terminal of the decoupling transistor, and a second terminal coupled to the second conduction line, and a control terminal coupled to the output of the inverter.

19. The circuit of claim 17, wherein the second protection circuit comprises:

a protection transistor having a first terminal coupled to the first conduction line, a second terminal coupled to the output of the inverter, and a control terminal coupled to the ground reference potential.

20. The circuit of claim 19, wherein the protection transistor has a threshold voltage lower than a threshold voltage of the decoupling transistor.